BIOSCAPE

Biodiversity Survey of the Cape

Adam Wilson, Erin Hestir, Jasper Slingsby
Anabelle Cardoso & Cherié Forbes
& the BioSCape Team

University at Buffalo
UNIVERSITY OF CALIFORNIA MERCED
UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD
NASA
SANSA SOUTH AFRICAN NATIONAL SPACE AGENCY
NRF National Research Foundation | SAEON South African Environmental Observation Network

The case for South Africa - exploring our capabilities

7 Terrestrial Biomes
4 Marine Biomes

9,000 plant species!

~1% Africa's area

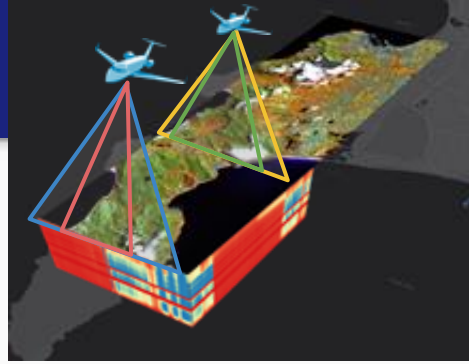
~20% Africa's plants

65% endemic

3rd highest marine endemism in the world

The Greater Cape Floristic Region (GCFR)

BioSCape: Biodiversity's Role in Ecosystem Function and Services



Data Cube with ~1,000 bands
spanning UV -> thermal
plus LVIS waveform lidar

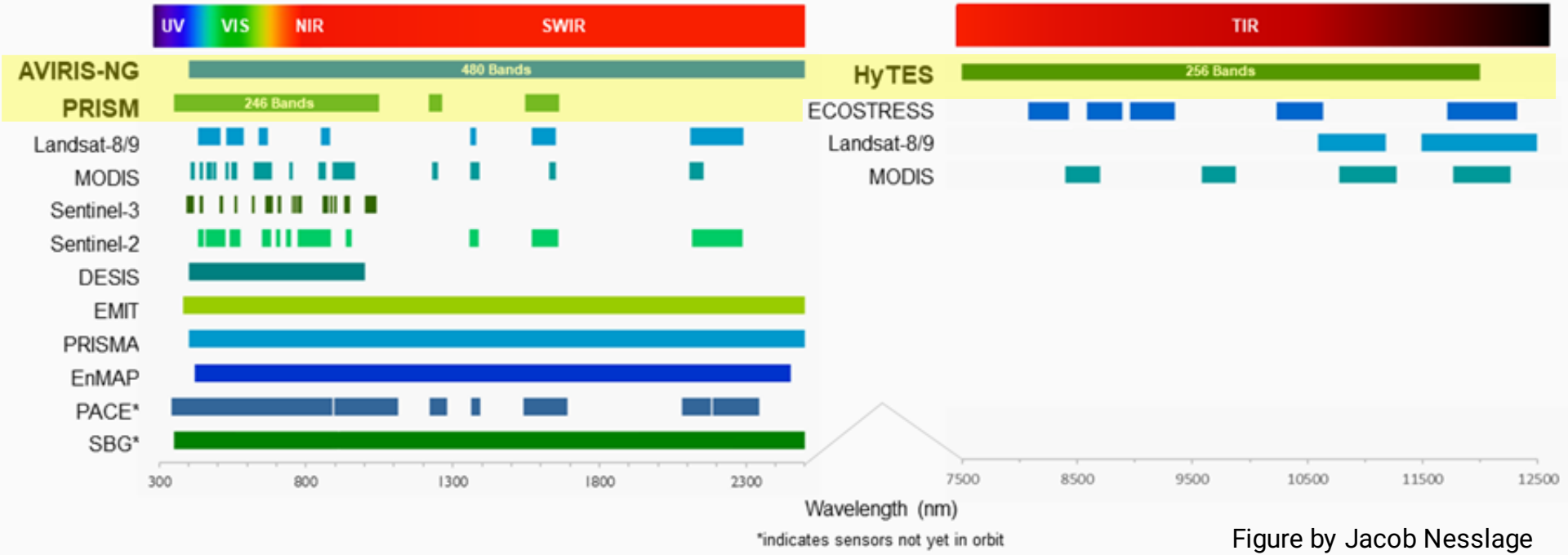


Figure by Jacob Nesslage

BIOSCAPE: Biodiversity Survey of the Cape

1. WE COLLECT DATA: REMOTE & IN-FIELD

REMOTE: landsat, sentinel, EMIT, ECOSTRESS

IN-FIELD: Phytoplankton functional types

IN-FIELD: Plant functional traits & species composition

IN-FIELD: Leaf & canopy spectra

IN-FIELD: Animal counts

IN-FIELD: DNA & eDNA samples

REMOTE: Imaging spectometry (UVSWIR & thermal) and laser altimeter

2. TO STUDY BIODIVERSITY

FUNCTIONAL DIVERSITY

TAXONOMIC DIVERSITY

PHYLOGENETIC DIVERSITY

SPECTRAL DIVERSITY

3. TO BETTER CONSERVE NATURE & ITS CONTRIBUTIONS TO PEOPLE

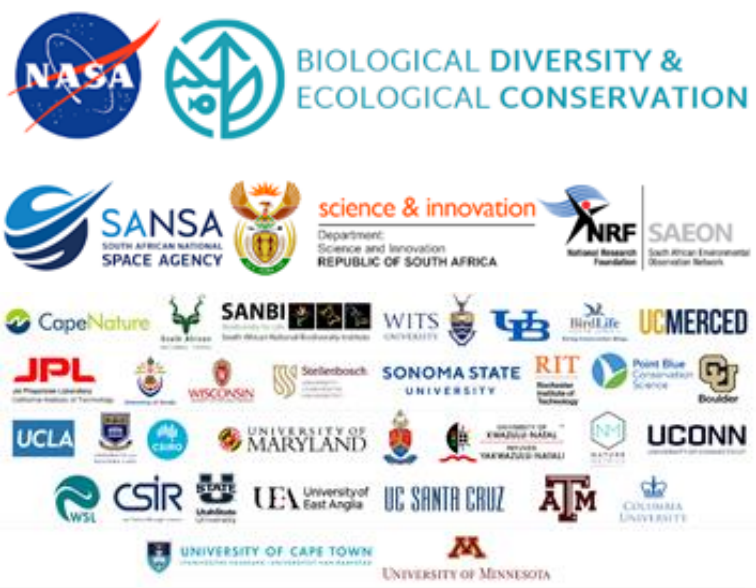
SHIFTING COMMUNITY COMPOSITION

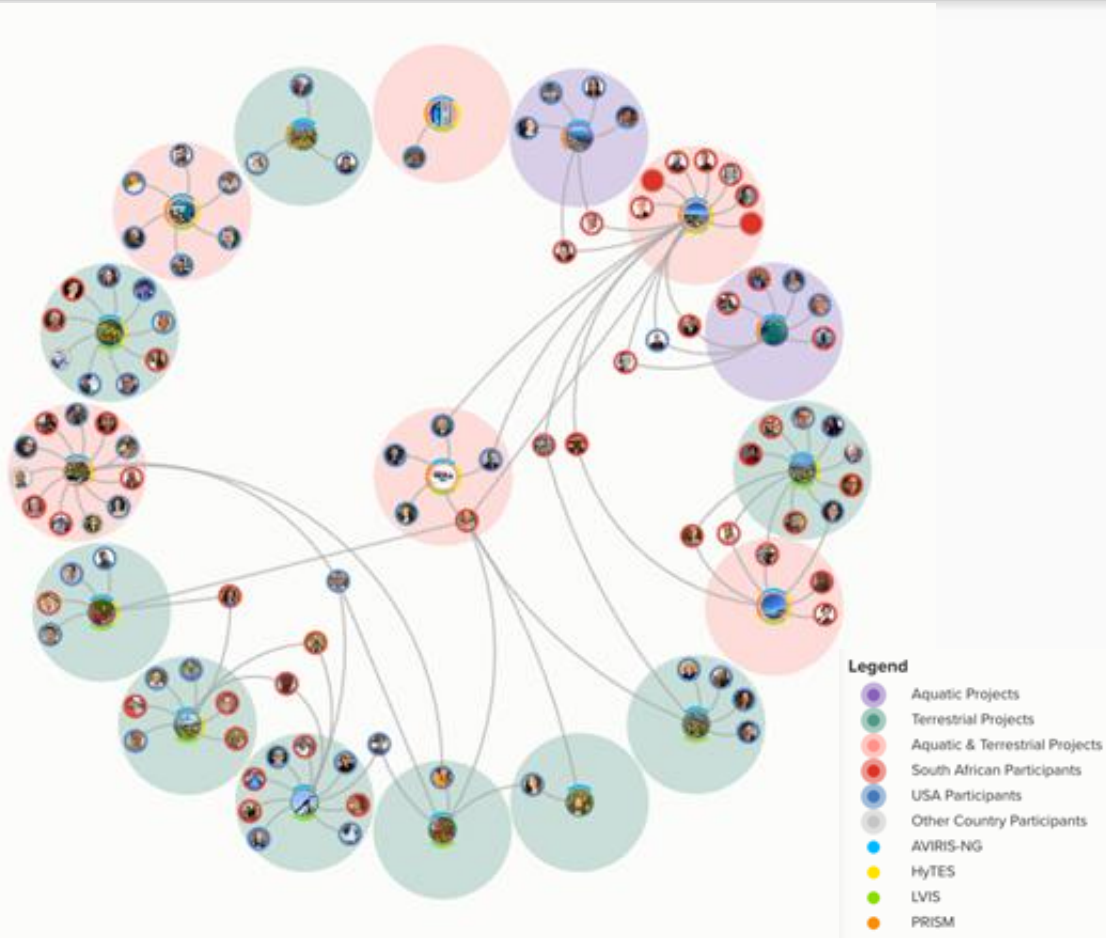
ECOSYSTEM DISTURBANCE, RESILIENCE & RECOVERY

ECOSYSTEM FUNCTION & CONTRIBUTION TO PEOPLE

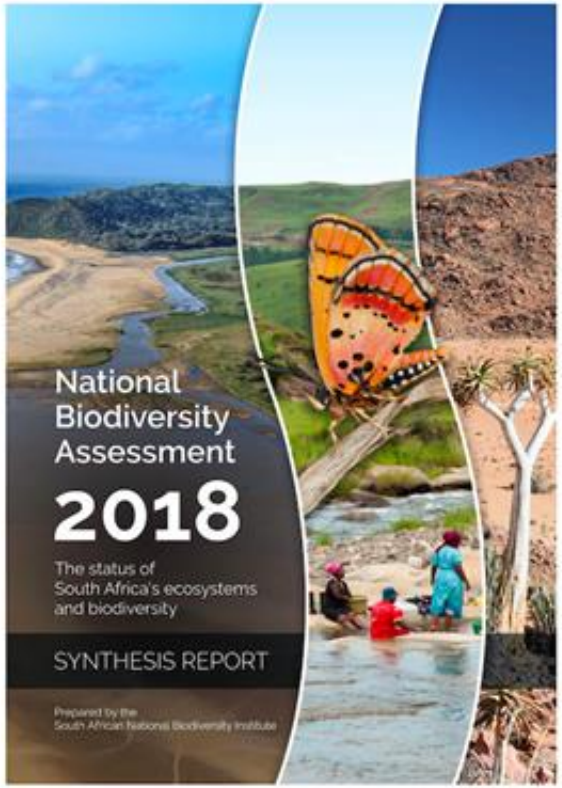
BioSCape Science Team

bioscape.io/team





South African Biodiversity Assessment



How many biodiversity-related jobs are there?

20 376
jobs protecting biodiversity

36 420
jobs restoring ecological infrastructure

15 193
jobs in biodiversity research and professional services

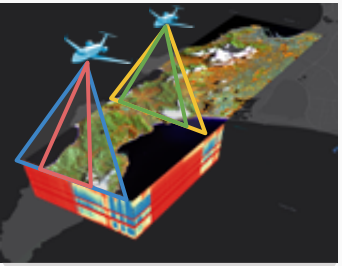
More than **418 000** biodiversity-related jobs

90 252
jobs in biodiversity-based tourism and recreation

256 298
jobs in extractive use of biodiversity

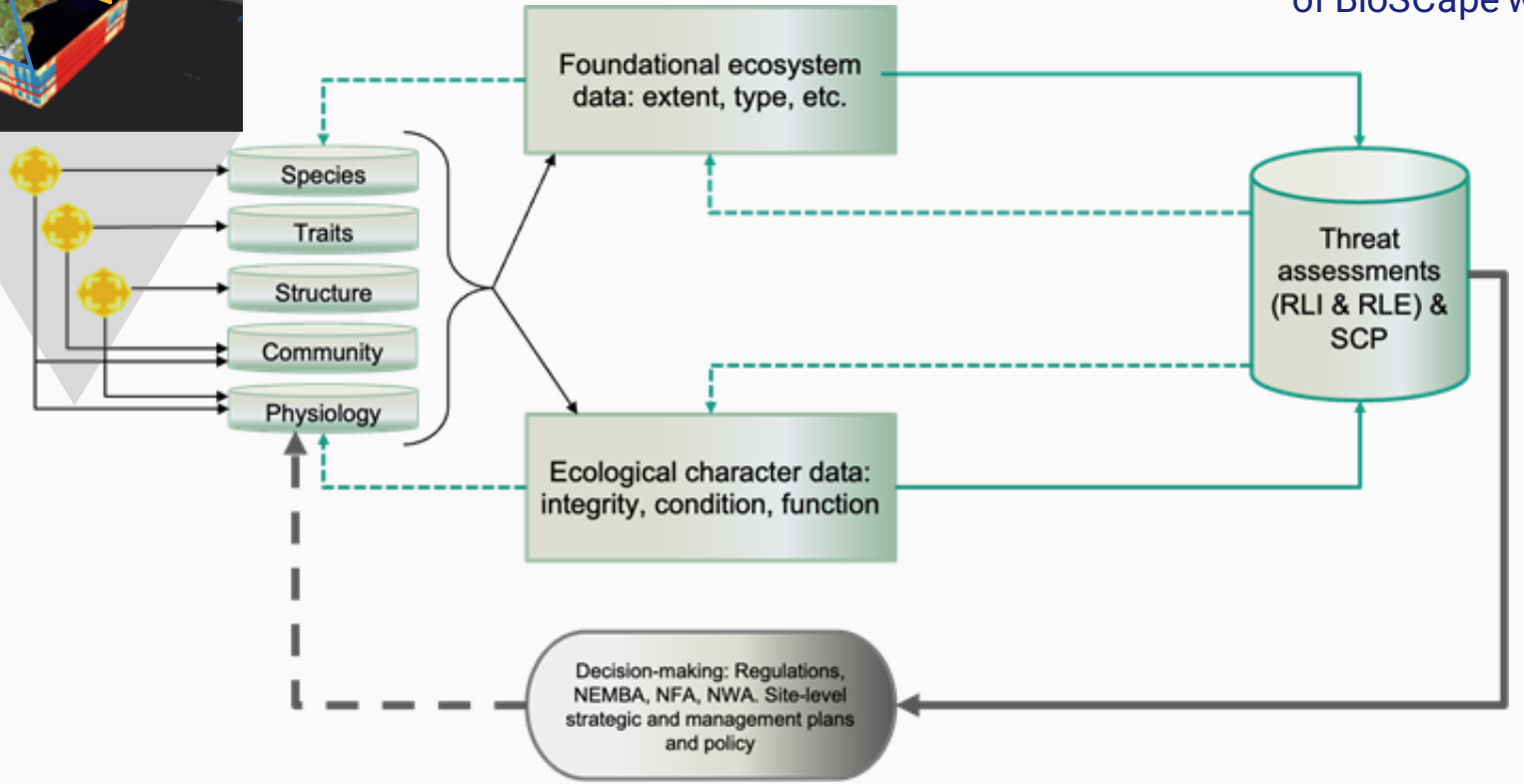
For each job dedicated to protecting biodiversity... **1 : 5** ...there are 5 jobs that depend directly on using biodiversity.

Developing pipelines to apply imaging spectroscopy for conservation and management



CapeNature · South African National Parks · SANBI Biodiversity for Life · South African National Biodiversity Institute

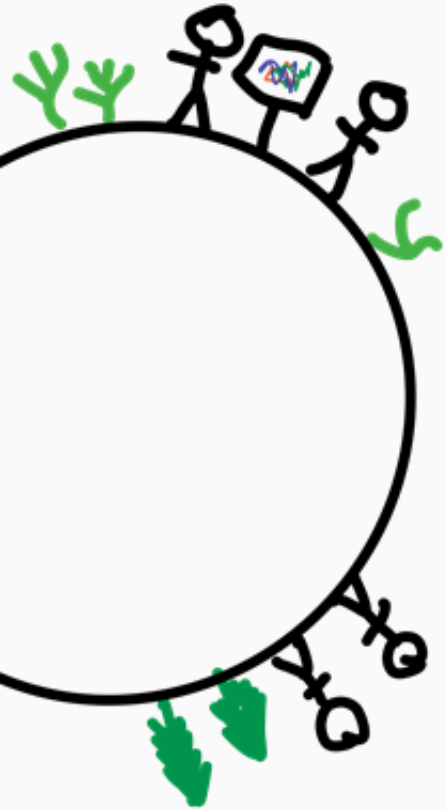
Workshop in two weeks to co-develop potential applications of BioSCape with SA Partners



Cherie Forbes, BioSCape Applications Coordinator

Outreach and Education

bioscape.io/opportunities



Applied Remote Sensing Training (ARSET)

Free training webinar covering BioSCape Instruments
April 2023 with over 1,300 participants, and over 100 from SA

UNESCO Outreach

UNESCO will support public outreach and education activities

Global Learning and Observations to Benefit the Environment

GLOBE Program will support activities in schools

COMPASS Science Communication Workshop

BioSCape Team members can apply for Science Communication Workshop to tell their stories

NASA Space Apps

The world's largest hackathon (2022: 31,500 registrants from 162 countries).
This year one one challenge is to address the BioSCape Science Objectives

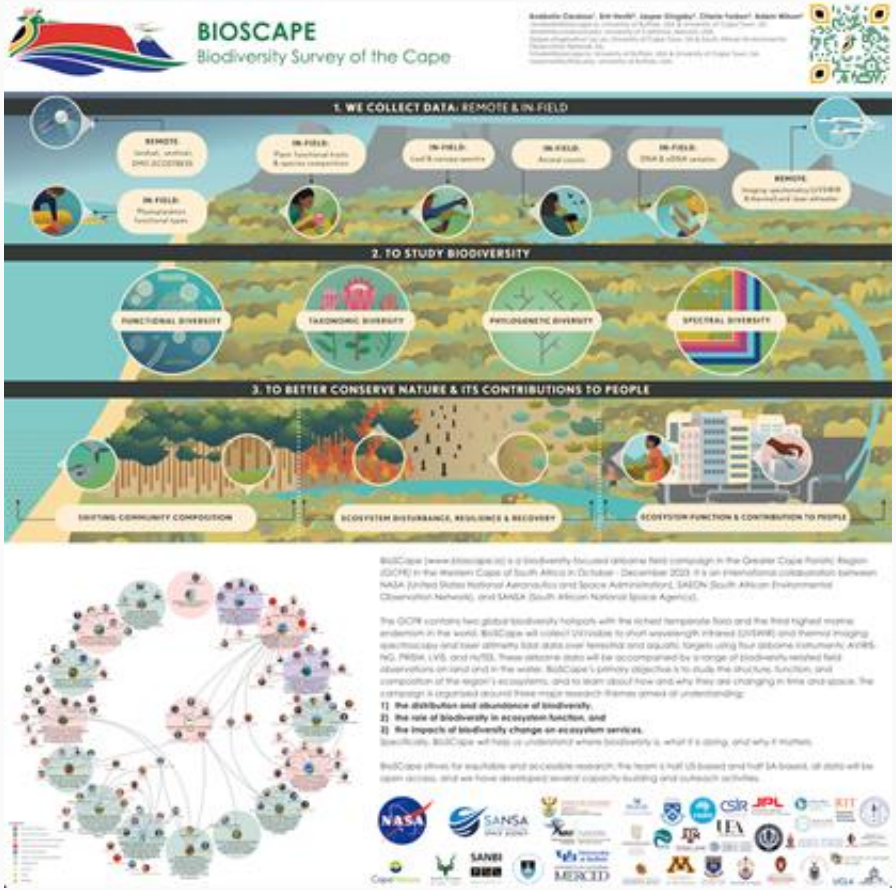
Plant Functional Traits Course

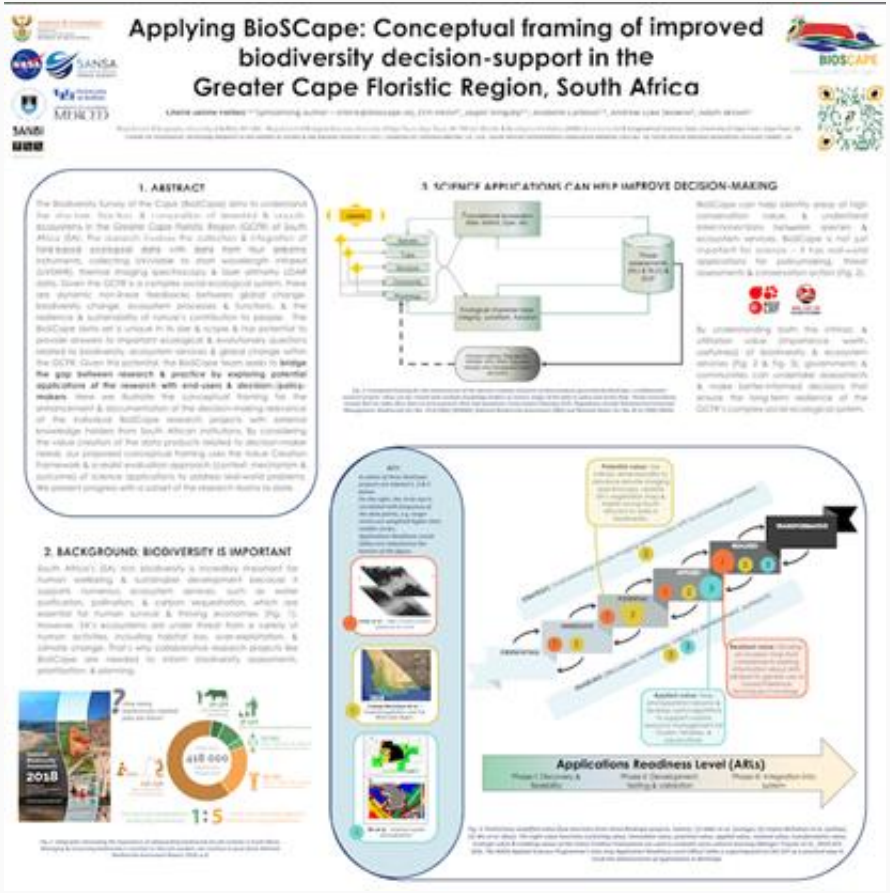
Plant Functional Traits Course to train SA students and collect data during the campaign

South African "Fishwater Films"

Producing a short film about the region's biodiversity and the project

Curious? Find us at the BioSCape Posters this afternoon (5-6:30)

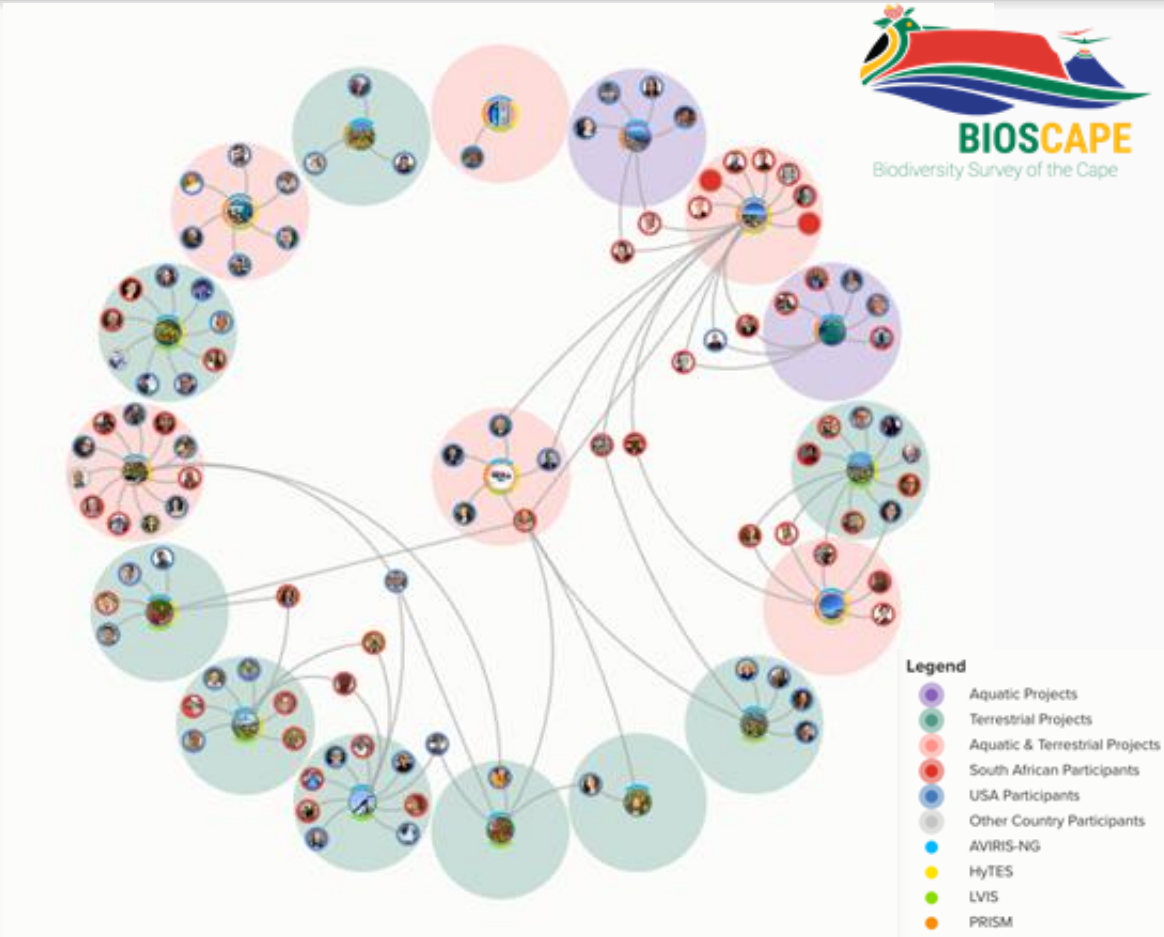




BioSCape Science Team

bioscape.io/team

Now we'll hear from the rest of the team



Thank you!

BioSCape.io

Adam M. Wilson adamw@buffalo.edu
Erin Hestir ehestir@ucmerced.edu
Jasper Slingsby jasper.slingsby@uct.ac.za
Anabelle Cardoso anabelle@bioscape.io
Cherié Forbes cherie@bioscape.io

University at Buffalo
UNIVERSITY OF CALIFORNIA MERCED
UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD